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Sexually Transmitted Infections in Canadian Street Youth



Findings from Enhanced Surveillance of
Canadian Street Youth, 1999-2003

March 2006

Canada

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Executive Summary

Street youth endure considerable hardship, including the uncertainty and danger of life on the streets. They exist in an economically and socially marginalized position because of their age, homeless status and lack of education and job skills.¹ Street youth may be more preoccupied with meeting their basic daily needs than with health risks. Their lifestyle may also predispose them to engage in high-risk behaviours¹ such as unprotected sex, sex with high-risk partners and sex with multiple partners – behaviours that increase their risk of contracting and transmitting sexually transmitted infections (STIs) and blood-borne infections. This report is based on *Enhanced Surveillance of Canadian Street Youth (E-SYS)*,² a multi-centre sentinel surveillance system that monitors rates of STIs and blood-borne pathogens, behaviours and risk determinants in Canada's street youth population. Key findings from 1999, 2001 and 2003 are presented below.

Key Findings

- Street youth are a sexually active population, with more than 95% reporting previous engagement in sexual activities.
- On average, street youth report having had no fewer than 17 sexual partners in their lifetime.
- A high proportion of street youth report not having used condoms with their regular or client partners during their most recent episode of sexual intercourse.
- Approximately one-quarter of street youth report having traded sex at some point in their lives.
- Rates of chlamydia and gonorrhoea in street youth are more than ten times those in the general youth population.
- Street youth do not seem to modify their sexual behaviours following the diagnosis of an STI.
- Hepatitis B immunity level is gradually increasing among street youth; however, the proportion of street youth with no immunity remains high.

Rates of STIs and blood-borne infections have been shown to be much higher among street youth than in the general youth population. As shown in this report, street youth do not take adequate measures to protect themselves from STIs. Even after being told they have an STI, some youth are still choosing not to use protection, while some discontinue using protection after a period of time.

Sufficient resources need to be allocated to provide outreach services such as STI prevention, screening and treatment to street youth, and such services need to be made accessible through community-based programs. Harm reduction approaches such as consistent and correct condom use, later initiation of sexual activities and reduction in the number of sexual partners need to be advocated among street youth.



1. Introduction

Street youth are at high risk for many health problems. It has been implied that the conditions youth find themselves in on the street may lead to behaviours that expose them to STIs and other blood-borne pathogens,⁶ as a higher STI prevalence and higher rates of sexual risk behaviours have been found among street youth.^{7, 8}

STIs and blood-borne pathogens may be transmitted by unprotected sexual contact or exposure to blood and body fluids.¹ Other important modes of transmission include the sharing of contaminated needles or other injecting materials, tattooing, and body piercing.^{1,3} STIs remain a major public health concern because of their association with pelvic inflammatory disease (PID), infertility, ectopic pregnancy, chronic pelvic pain and the transmission and acquisition of HIV.^{7,9}

The risk of contracting STIs and blood-borne pathogens increases during adolescence and early adulthood due to the initiation of sexual activity and drug use.⁴ Research has shown that early initiation of sexual activity has been linked to increased risk of STIs, and has been found to be associated with higher STI levels,¹⁰ than later initiation. In previous studies, more than 94% of street youth reported being sexually active, with an average age of 14 at their first sexual intercourse.^{3,12} Street youth also reported having sex with one or more high-risk partners (prostitutes, injecting drug users and HIV positive individuals), with males more likely to report high-risk partners than females.³ Prostitution is reported to be a common occurrence among street youth.^{12,13} Between 12% and 32% of street youth in Canada are estimated to be involved in prostitution.¹³

Knowing the factors that put street youth at risk for STIs and blood-borne pathogens is imperative in identifying areas for intervention and establishing harm reduction measures that will benefit street youth and reduce their risk of contracting STIs. The Public Health Agency of Canada's *Enhanced Surveillance of Canadian Street Youth* (E-SYS) is intended to provide those delivering prevention, care and treatment services to the street youth population with such data, and also to alert service providers of changes in rates of selected STIs and sexual risk behaviours in street-involved youth. This information can be used to assess policies and programs targeting this vulnerable segment of society.

1.1 Purpose

Information presented in this report is based on E-SYS. Collecting information on sexual health, STIs and blood-borne pathogens through repeated behavioural surveys was intended to reach the following goals:

- to monitor the prevalence of chlamydia, gonorrhoea, syphilis, herpes simplex virus (HSV), HIV, human T-cell lymphotropic virus (HTLV) and hepatitis C virus (HCV) infection in Canadian street youth over time;
- to monitor hepatitis B immunity level and identify its determinants;
- to identify demographic and social variables associated with risky sexual behaviours among Canadian street youth; and
- to identify potential risk factors associated with chlamydia, gonorrhoea, syphilis, HIV, HSV and HCV infection in Canadian street youth.



2. Method

The E-SYS is a multi-centre sentinel surveillance system that monitors rates of STIs and blood-borne pathogens, behaviours and risk determinants in the Canadian street youth population through repeated behavioural surveys accompanied by appropriate biological sampling (blood and/or urine testing). A pilot project launched in October 1998 (phase I) investigated the feasibility of studying the street youth population. Data collection was conducted in large urban centres across Canada, biannually, starting in 1999 (phase II) and continuing in 2001 (phase III) and 2003 (phase IV). The survey period was from February to October for all phases of data collection. In phase II, the recruitment of youth involved informal snowball sampling methods, a method shown to be effective in the recruitment of hard-to-reach populations.¹⁴ For the purposes of the behavioural surveys, the inclusion criteria were that respondents: (a) were between 15 and 24 years of age; (b) were able to speak either French or English; and (c) had, in the previous six months, either been absent from their residence for at least three consecutive nights, or run away from home (or another place of residence) for three days or more, or been thrown out of their home for three days or more, or been without a fixed address for three days or more.

Participants were recruited through drop-in centres and outreach work. There were two interviewer-administered questionnaires. The first questionnaire consisted of questions on demographics, lifestyle, sexual practices, attitudes and knowledge of risk behaviours and family history. In addition to answering the questionnaire, consenting youth were asked to provide a urine sample and a blood sample. If necessary, a second questionnaire that addressed issues concerning barriers to partner notification was administered as a follow-up to youth whose urine or blood sample tested positive for STIs or blood-borne pathogens. Phases III and IV of the study followed the same methodology as phase II. Youth were permitted to participate in the survey only once during each data collection year. A total of 4728 street youth were recruited over the three phases of data collection: 1645 in 1999, 1427 in 2001, and 1656 in 2003.

2.1 Analysis

Data were analyzed using the SAS statistical software package (version 8). Chi-square statistics were used to compare distributions across demographic factors. A two-tailed p -value of < 0.05 was defined as statistically significant for univariate analysis. Further multivariate analyses using logistic regression models were conducted, with a p -value of < 0.10 defined as statistically significant, to select independent factors associated with specified outcomes.

For more detailed information, please refer to the methodology section of the 2005 *Enhanced Surveillance of Street Youth in Canada* report by the Public Health Agency of Canada.² For the purposes of this report, younger youth are defined as 15–19 years of age, while older youth are defined as 20–24 years of age.

2.1.1 Analysis Terms

Univariate analysis is a statistical analysis that examines one factor or variable at a time. In this report, univariate analysis was conducted using the chi-square test for heterogeneity.

Statistically significant relationships in univariate analyses are defined by a p -value <0.05 and are denoted by (\$) in this report.

Multivariate analysis is a statistical analysis that examines numerous factors or variables simultaneously, i.e. it examines independent associations between multiple variables. Logistic regression analysis was employed for multivariate analysis.

Independent associations were determined by multivariate analysis. They are denoted by (†) in the report. Variables found to be significantly associated with outcomes of interest in univariate analysis were included in multivariate analysis. Independent variables included in multivariate model building were: age; sex; previous STIs; age at initiation of sexual activity; number of participants' sexual partners over their lifetime; whether participants had been in jail, foster care, and group homes, been assigned to a social worker, had had unwanted sex, had been expelled from school, and had dropped out of school; and participants' perceived risk of contracting STIs.

2.2 Laboratory Methods

The Roche Amplicor PCR test was used to detect *Chlamydia trachomatis* and *Neisseria gonorrhoeae*. Herpes simplex virus (HSV) antibody was screened using HSV I/II EIA (Meridian); repeatedly reactive and discordant results on EIA were confirmed by type-specific line immunoassay (MRL Diagnostics). Hepatitis C virus (HCV) antibody was screened using Ortho HCV 3.0 EIA; repeatedly reactive results on EIA were confirmed by immunoblot (HCV 3.0 RIBA) assay. PCR testing was used to detect recent seroconversion if the RIBA (v3) result was indeterminate. Testing was also done for hepatitis B virus (HBV) serology markers (antibodies to HBV surface antigen and core antigen). Syphilis testing was performed using serological testing (RPR/VDRL) followed by confirmatory testing (FTA-ABS/MHA-TP).

2.3 Limitations

The E-SYS has several limitations that should be noted.

- First is its cross-sectional design. As is the case for all cross-sectional research, it does not allow causality to be established.
- Second, the sample is limited to seven urban centres across Canada. We view this as both a strength and a limitation. It is a strength in that it documents the presence and the plight of street youth in cities where they are most often situated. The limitation is that the findings may not be applicable to other geographic areas or to less populated areas.

- Third, the recruitment of youth involved informal snowball sampling methods, where the study was well advertised and news of it passed verbally to potential participants, without the use of specific geographic sampling frames or direct linked referrals. While this technique has been shown to be effective in hard-to-reach populations such as street youth, it could result in a selection bias.
- Finally, findings were based on self-reported data. As such, veracity of the information provided could not be established except for specific STIs and blood-borne pathogens, for which blood or urine testing was performed. Also, street youth in this sample may have been reluctant to report socially undesirable behaviours such as unprotected sex, commercial sex trade work and injecting drug use.

3. Demographic Profile of E-SYS Participants



Table 1 shows selected demographic characteristics of the street youth population for the survey years.

Table 1. Demographic profile of street youth recruited for E-SYS

Demographics	1999	2001	2003
	%		
Gender			
Male	61.7	56.6	62.9
Female	38.3	43.4	37.1
Mean Age (years)	18.9	19.0	19.7
Place of Birth			
In Canada	92.2	92.9	91.9
Outside Canada	7.9	7.1	8.1
Ethnic origin*			
Aboriginal	27.7	33.6	36.3
Caucasian	63.3	60.1	59.5
African /Black	4.3	4.2	5.3
Others	8.5	8.5	7.0

* Youth were allowed to report more than one ethnic origin; therefore, total percentages may add up to more than 100%

In all survey years, there was a greater proportion of male participants than female participants, with a ratio of approximately 2:1. The overall average age was 19 years across surveys. The majority of street youth in the surveillance population were Canadian-born; only about 8% reported being born outside of Canada. Aboriginal youth accounted for roughly one-third of participants across data collection years.

For an in-depth discussion of the demographic and socio-economic characteristics of street youth, please refer to the 2005 *Enhanced Surveillance of Street Youth in Canada* report by the Public Health Agency of Canada.²



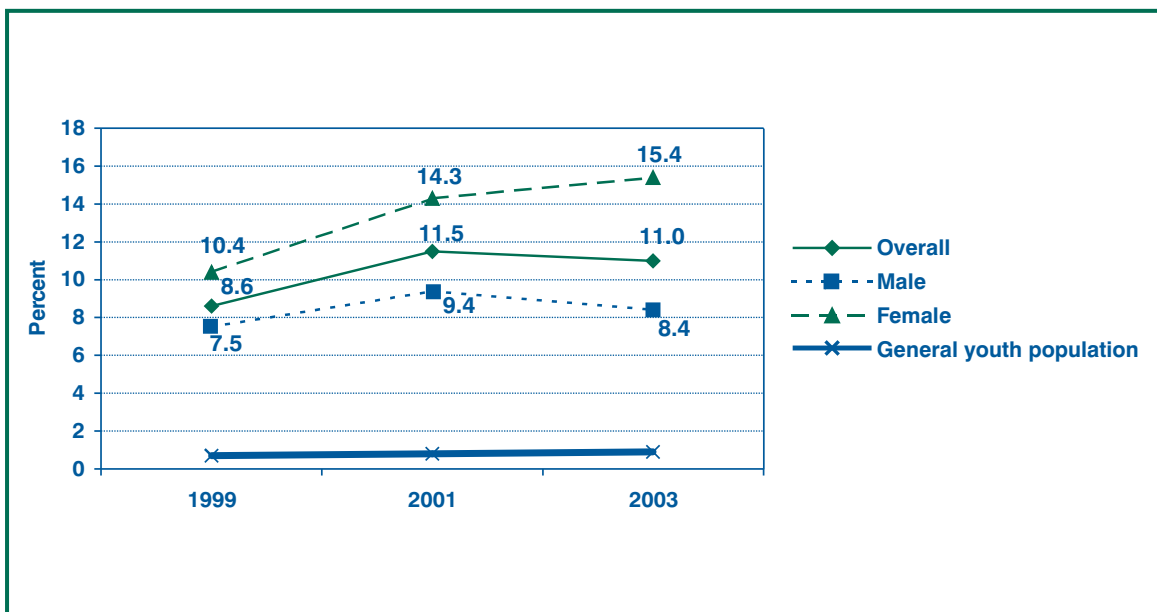
4. Prevalence

Prevalence rates are presented for chlamydia, gonorrhoea, syphilis, hepatitis C, HIV, herpes simplex infection, and hepatitis B exposure. Rates in street youth indicated in this report are prevalence rates. They are compared to rates in the general youth population (ages 15 to 24 years) derived from nationally reported cases documented through routine surveillance. Nationally reported rates reflect only those individuals who come forward for testing; therefore, they likely underestimate the actual prevalence rates in the general population.

4.1 Chlamydia

Chlamydia is an easily curable STI, which is caused by the bacterium *Chlamydia trachomatis*. It can be transmitted through oral, vaginal or anal sexual contact with an infected partner. Chlamydia may lead to serious problems such as infertility; it may also cause pneumonia and other illnesses in newborn babies of infected mothers. Genital chlamydia infection is the most commonly reported bacterial STI in Canada. Since 1997, youth between the ages of 15 and 24 have accounted for over two-thirds of all reported chlamydia cases in Canada.⁹ As seen in Figure 1, the prevalence of chlamydia in Canada's street youth is greater than 10%; that is about 10 times higher than the reported prevalence among general population youth,¹⁶ which is less than 1%. Since up to 80% of chlamydia infections may be asymptomatic, many cases remain undetected; it has therefore been suggested that a hidden chlamydia epidemic may exist in Canada's street youth population.⁹

Figure 1. Chlamydia prevalence among street youth in 1999, 2001 and 2003

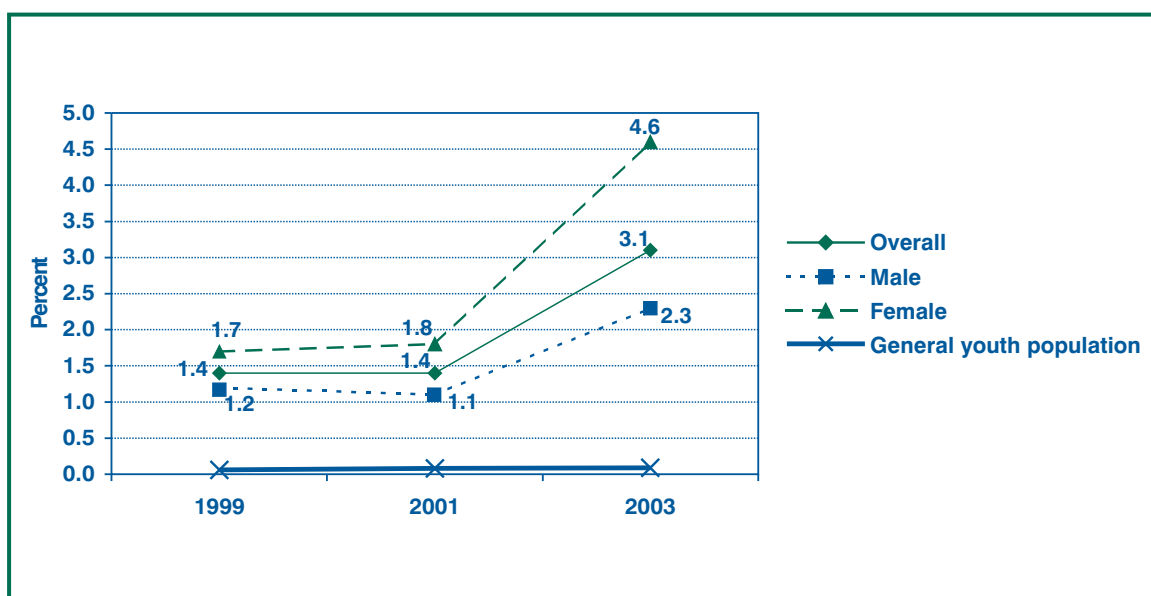


Results from E-SYS show that the prevalence of chlamydia in street youth increased from 8.6% in 1999 to 11% in 2003 (Figure 1). In the general youth population, the prevalence of chlamydia rose from 0.7% to 0.9% in the same time period. In the 2001 and 2003 E-SYS surveys, chlamydia rates were significantly^s higher among female street youth than among males (14.3% vs. 9.4% and 15.3% vs. 8.4% respectively). Gender was also found to be independently associated^l with chlamydia rates in 2001 and 2003, as females were more likely to have chlamydia than males. Chlamydia rates did not differ significantly by age across survey years.

4.2 Gonorrhoea

Gonorrhoea is an STI caused by the bacterium *Neisseria gonorrhoeae*. It is mainly transmitted through sexual contact. However, mothers infected with gonorrhoea may also transfer the disease to their infants during delivery. It is possible to be infected with gonorrhoea and not have symptoms, which means gonorrhoea may often go untreated for some time. This can lead to serious health problems in later life, such as pelvic inflammatory disease (PID).

Figure 2. Gonorrhoea prevalence among street youth in 1999, 2001 and 2003



As with chlamydia, the prevalence of gonorrhoea is high in the street youth population, about 20 to 30 times higher than in the general youth population. The prevalence of gonorrhoea among street youth increased significantly^s during the study period, from 1.4% in 1999 and 2001 to 3.1% in 2003 (Figure 2). This increase is substantially higher than the general youth population's, where the rate increased from 0.06% in 1999 to 0.09% in 2003.¹⁶ In 2003, the prevalence of gonorrhoea was significantly^s higher in older street youth (20–24 years) than in younger youth (15–19 years) (4.4% and 2.2% respectively) and in female street youth than in their male counterparts (4.6% and 2.3% respectively).

4.3 Syphilis

Syphilis is caused by the bacterium *Treponema pallidum*. The infection is almost always transmitted by sexual contact (including oral sex) with an infected person, with the exception of congenital syphilis, which is spread from a mother to her fetus. There are four stages through which untreated syphilis progresses, each stage characterized by its own unique signs and symptoms: primary, secondary, latent and tertiary.¹⁷

Testing for syphilis was not performed in E-SYS in 1999. A notable increase in infectious syphilis (primary, secondary and early latent syphilis) among street youth was seen between 2001, where there were no detected cases, and 2003, when the prevalence was 0.7% (10 cases). The prevalence of infectious syphilis in older street youth was significantly^s higher than in younger youth in 2003 (1.3% vs. 0.3%). There was no significant difference in the prevalence of infectious syphilis between male street youth and their female counterparts in that survey year. Table 2 presents the prevalence rates of chlamydia, gonorrhoea and infectious syphilis among street youth compared to the reported prevalence rates in the general youth population from 1999 to 2003.

Table 2. Prevalence rates of chlamydia, gonorrhoea and infectious syphilis among street youth and in the general youth population in 1999, 2001 and 2003

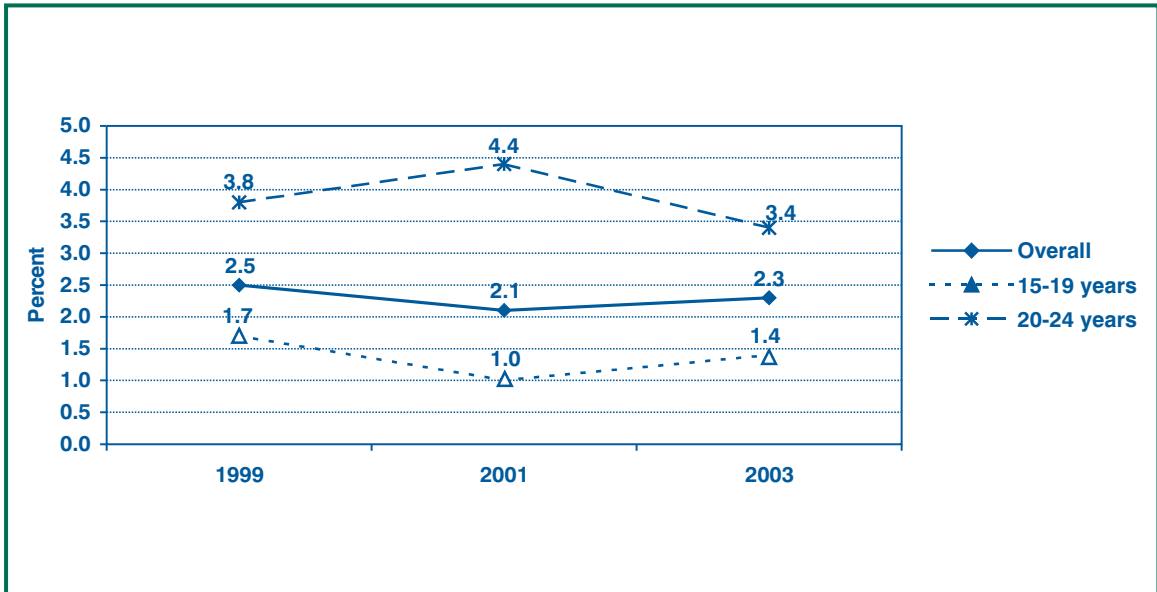
Age	Street Youth (General Youth Population)* ¹⁶		
	1999	2001	2003
	%		
Chlamydia			
15–19 years	8.98% (0.65%)	11.51% (0.74%)	10.88% (0.82%)
20–24 years	7.87% (0.75%)	11.38% (0.88%)	11.04% (0.99%)
Gonorrhoea			
15–19 years	1.56% (0.06%)	1.04% (0.07%)	2.19% (0.08%)
20–24 years	0.90% (0.07%)	2.12% (0.09%)	4.38% (0.10%)
Infectious Syphilis			
15–19 years	–	0% (< 0.01%)	0.25% (< 0.01%)
20–24 years	–	0% (< 0.01%)	1.31% (< 0.01%)

* Rates in street youth are prevalence rates; the rates they are compared to in the general youth population are derived from reported cases. Rates from reported cases may underestimate actual prevalence in the general population due to asymptomatic cases and those who do not report for testing.

4.4 Hepatitis B

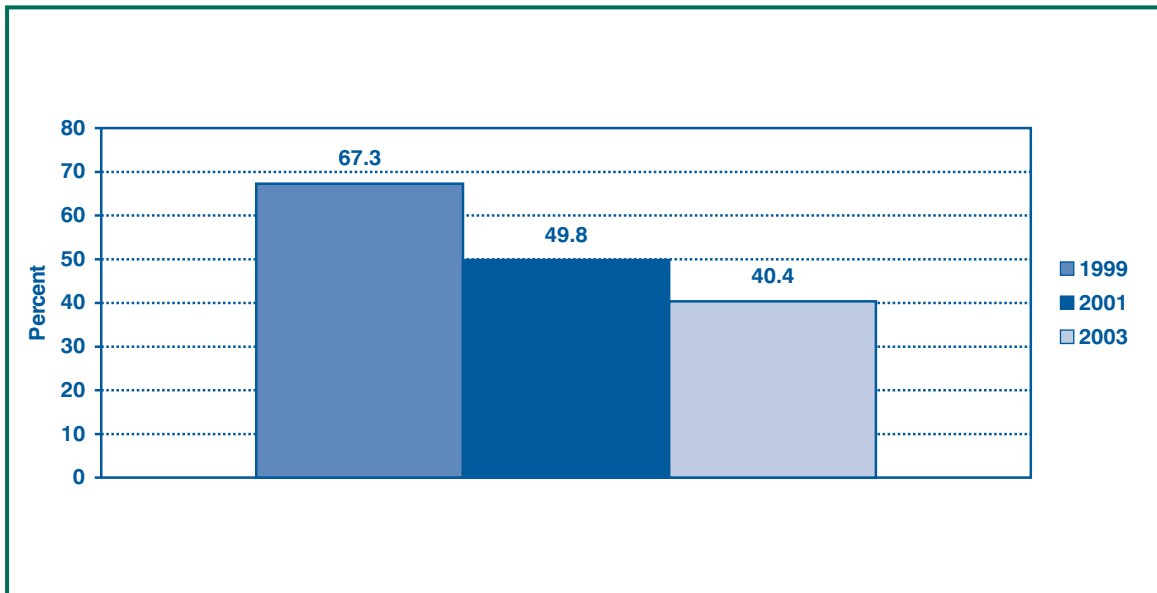
Hepatitis B infection is caused by the hepatitis B virus (HBV), a sexually transmitted blood-borne virus. HBV is spread through sexual contact with infected individuals, injecting drug use and exposure to infected body fluids, and vertically from a mother to her newborn child. HBV may cause lifelong infection, cirrhosis (scarring) of the liver, liver cancer, liver failure and death. Hepatitis B vaccine is available for all age groups to prevent hepatitis B virus infection. Virtually all individuals currently infected with HBV will have detectable serum hepatitis B surface antigens (HBsAg).¹⁸

Figure 3. Proportion of street youth who had been exposed* to hepatitis B in 1999, 2001 and 2003



* Exposure detected by antibodies to hepatitis B core antigens.

Figure 4. Proportion of street youth susceptible* (no immunity) to hepatitis B in 1999, 2001 and 2003



* Susceptible = anti-HBs negative and anti-HBc negative.

As seen in Figure 3, from 1999 to 2003 the proportion of street youth who had been previously exposed to HBV remained relatively constant (2.5% in 1999, 2.1% in 2001 and 2.3% in 2003) while there was a significant[§] variation in the proportion of younger and older street youth exposed to HBV in different survey years (1.0% vs. 4.4% in 2001, and 1.4% vs. 3.4% in 2003).

The proportion of street youth susceptible to the virus decreased significantly[§], from 67.3% in 1999 to 40.4% in 2003 (Figure 4). Despite this significant trend, the proportion of street youth who are at risk of infection with hepatitis B remains high.

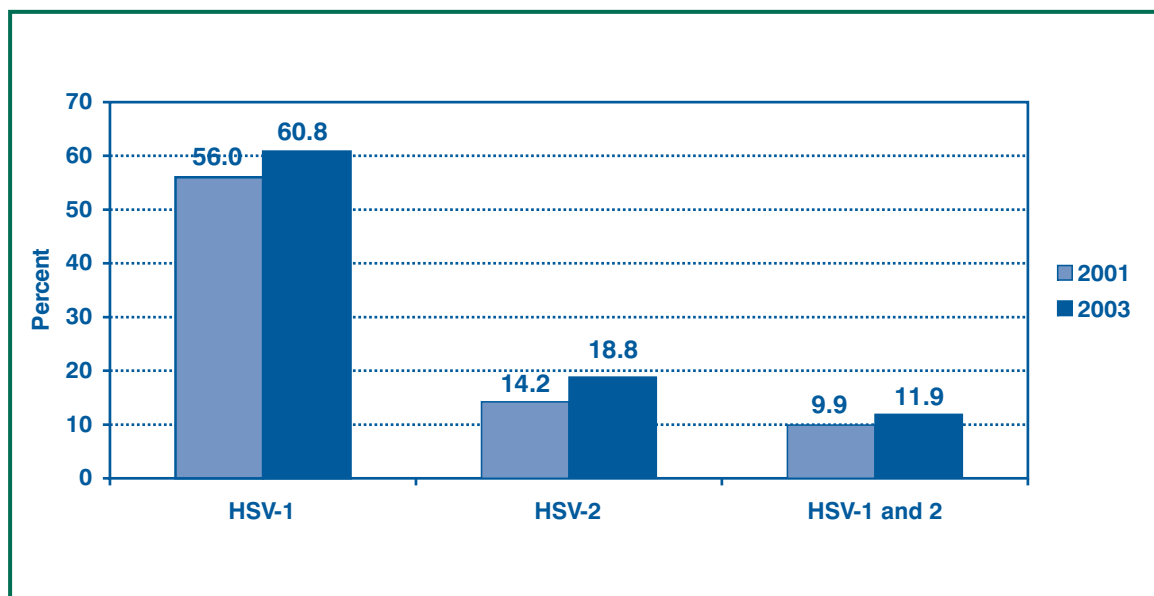
In the 2003 survey, youth were asked to report on their vaccination status. Of the 708 who said “yes” to having completed hepatitis B vaccination, results of blood tests revealed that only 70.8% (502) showed evidence of immunity due to vaccination.

Blood tests also showed that younger youth were significantly[§] more likely to have vaccine-induced immunity (defined as anti-HBs positive and anti-HBc negative) than older youth (54.8% vs. 34.4% in 2001, and 66.0% vs. 45.8% in 2003). This may be due to the fact that younger youth were more likely to have been vaccinated through school-based programs targeting pre-adolescents, which were implemented in the early 1990s across Canada.¹⁸ The vaccination completion rate in the Canadian pre-adolescent population was reported to be very high, between 91% and 93%.¹⁹

4.5 Herpes Simplex Infection (Genital Herpes)

Most cases of genital herpes are caused by herpes simplex virus 2 (HSV-2). HSV-1 most commonly causes sores on the lips (known as “fever blisters” or “cold sores”), but may cause genital infections as well. Genital herpes is usually sexually acquired.

Figure 5. Prevalence rates of HSV-1, HSV-2 (mono-infections*), and HSV-1 and 2 co-infection among street youth in 2001 and 2003**



* Mono-infection refers to being infected with either HSV-1 or HSV-2 alone.

**HSV-1 and 2 co-infection occurs when HSV-1 and HSV-2 are both present.

Street youth were not tested for herpes simplex in 1999. From 2001 to 2003, the prevalence rate of HSV-1 among street youth increased from 56.0% to 60.8% (Figure 5). In 2001, rates were significantly^s higher in female street youth than in males (59.6% vs. 53.2%) and in older street youth than in younger street youth (65.2% vs. 51.4%).

HSV-2 prevalence was significantly^s higher in female street youth than in males in 2001 and 2003 (22.6% vs. 7.6% in 2001 and 29.4% vs. 12.6% in 2003). HSV-2 prevalence was also significantly^s higher in older street youth than younger street youth in both years (23.5% vs. 9.5% in 2001 and 23.2% vs. 15.3% in 2003). Gender and age were found to be independently associated^l with HSV-2 rate, as prevalence was higher in females than males and higher in older youth than younger youth, in both 2001 and 2003.

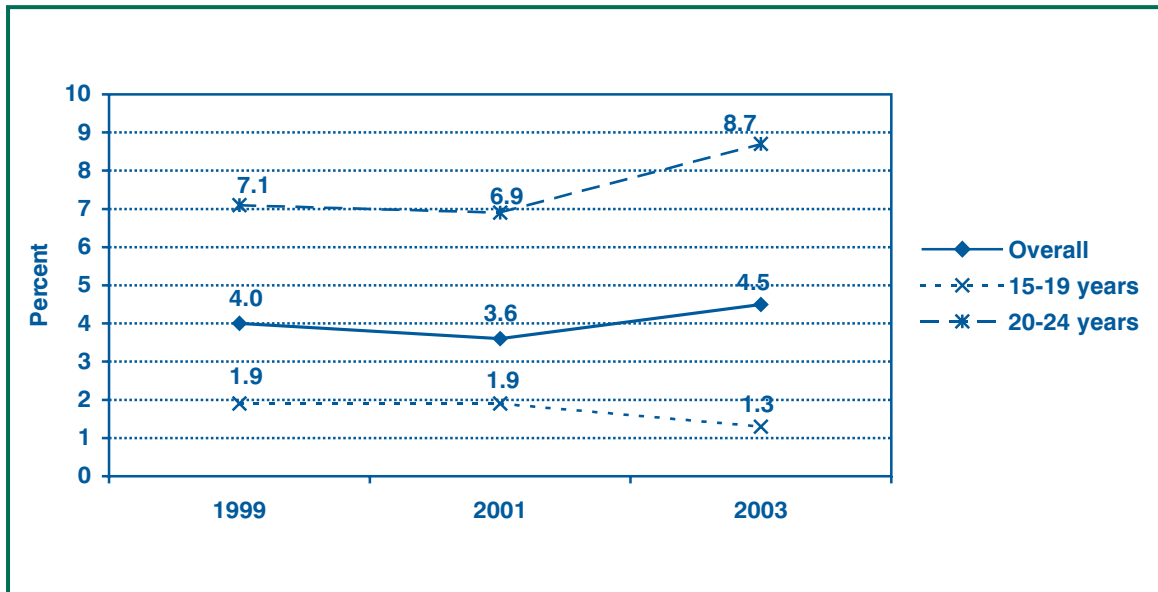
Co-infection with both HSV-1 and HSV-2 was not as prevalent as either HSV-1 infection or HSV-2 infection. As with HSV-1 and HSV-2 mono-infection, rates of HSV-1 and 2 co-infection in females and in older street youth were significantly^s higher than rates in male and younger youth in both 2001 and 2003 (16.0% vs. 5.2% and 18.3% vs. 5.8% respectively in 2001, and 18.0% vs. 11.9% and 15.6% vs. 9% respectively in 2003).

4.6 Hepatitis C*

Hepatitis C is caused by the hepatitis C virus (HCV). HCV is a blood-borne virus that affects the liver. Transmission of HCV occurs primarily through contact with infected blood, but may also occur inefficiently from non-traumatic sexual contact or from an infected mother to her baby.

The prevalence of hepatitis C among street youth did not change significantly from 1999 to 2003. Older street youth had significantly^s higher rates of hepatitis C than did younger youth in all survey years (Figure 6). While the rate of infection declined slightly among younger youth, the rate among older youth increased from a low of 6.9% in 2001 to a high of 8.7% in 2003. In 2001 only, female street youth had a significantly^s higher rate of hepatitis C infection than did males.

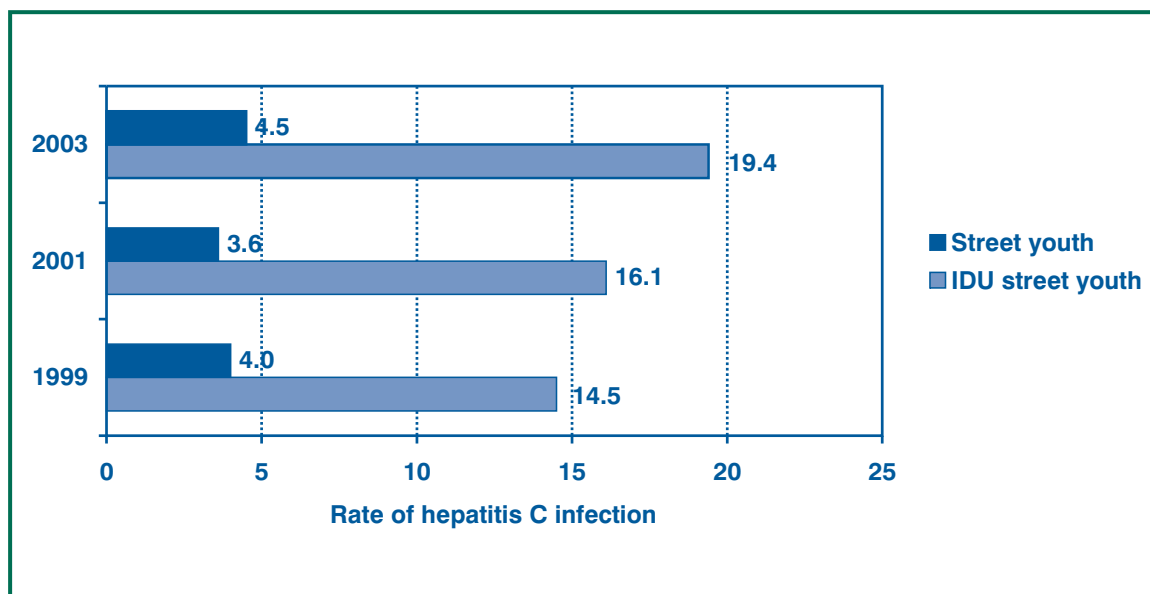
Figure 6. Prevalence rates of hepatitis C infection among street youth in 1999, 2001 and 2003



* While sexual contact is not the main route for hepatitis C transmission, it remains a possibility that should not be discounted.

Older street youth were found to be more likely to inject drugs,²⁰ which may account for the difference in rates between age groups, as injecting drug use is a major risk factor for hepatitis C.^{21, 22} The rate of hepatitis C infection in street youth who reported a history of injecting drugs (IDU) was 14.5% in 1999, 16.1% in 2001 and 19.4% in 2003. Figure 7 shows the hepatitis C rate among IDU street youth compared to the overall street youth population. As shown, youth who reported IDU had a significantly[§] higher prevalence of hepatitis C than those who did not. More in-depth analysis and discussion of the relationship between HCV and IDU is available in the *Hepatitis C and IDU among Street Youth Report*.²³

Figure 7. Rate of hepatitis C infection among IDU street youth in 1999, 2001 and 2003



4.7 HIV

The prevalence rate of HIV in street youth did not change significantly in all survey years. In 1999, fewer than 1% of street youth were infected with HIV. In both 2001 and 2003, the rates differed by age category. In 2001, most HIV infection among street youth was seen in older youth (0.3% vs. 2.3% respectively). In 2003, all eight (0.7%) HIV infections were among older youth. Risk factors for HIV infection were not assessed due to the small number of cases reported.

4.8 HTLV

The human T-cell lymphotropic virus (HTLV) is a retrovirus. There are two types; HTLV-1 and HTLV-2. The virus can be transmitted by blood or intimate sexual contact, and can be passed from mother to child during pregnancy and through breast milk. Most infected persons remain healthy carriers of the virus. In rare cases, however, HTLV-1 can cause adult T-cell leukemia/lymphoma (ATL), a rare and aggressive cancer of the blood.¹⁷ Testing for HTLV in E-SYS was performed in 2001 and 2003. In both years, there was only one laboratory-confirmed case of HTLV-1.

5. Sexual Behaviours and STIs



Associations between the rates of chlamydia, gonorrhoea and genital herpes (HSV-2) infection and sexual behaviours that may put youth at risk for STIs were examined for this report. HIV, HTLV and infectious syphilis were not examined, due to their low prevalence among street youth – the numbers were too low to allow for meaningful analysis of associations. Associations between sexual behaviours and the prevalence of hepatitis B infection were also not examined in this report.

5.1 Sexual Activity

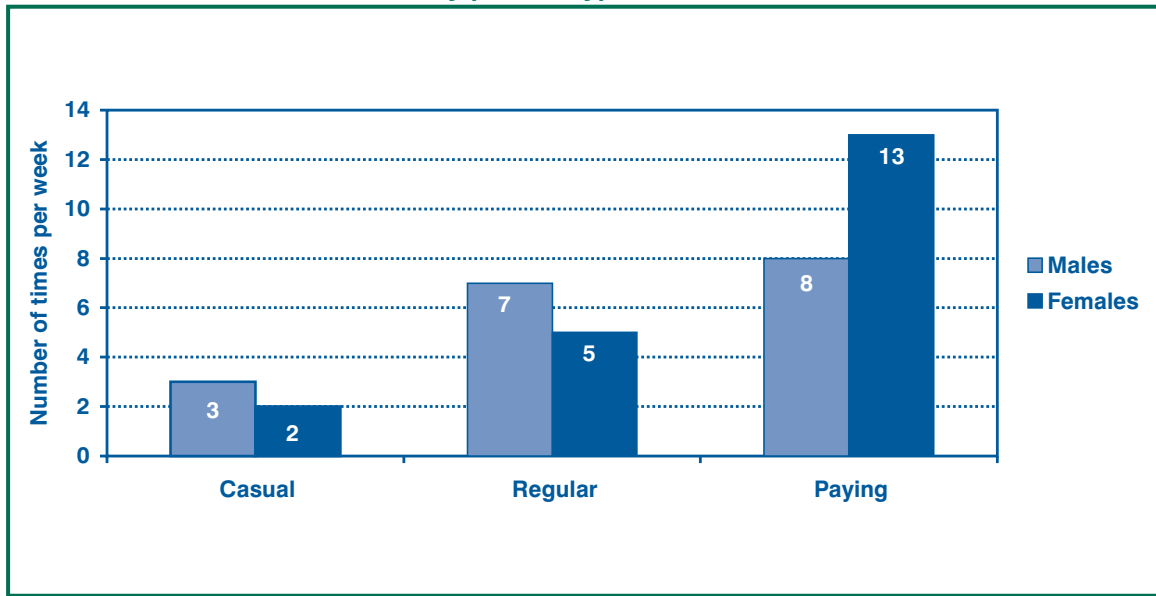
Overall, more than 95% of street youth reported previous engagement in sexual activities – which is consistent with other reports³ – and the average age at first sexual intercourse among sexually active youth was 14 years. This age did not differ between male and female youth, and it is much lower than the average age of first sexual intercourse in the general youth population in Canada, which is 16.8 years.²⁴ Between 1999 and 2003, on average, street youth who tested positive for chlamydia reported having sexual intercourse at a significantly[§] younger age than youth who tested negative (13.7 vs. 14.1 in 1999 and 13.8 vs. 14.1 in 2003).

In 2003, about 50% of street youth reported having had sexual activity** in the week prior to the interview; the average number of sexual activities per week ranged from 2 with casual (non-regular) partners to 13 with paying partners (Figure 8). Male street youth reported having sex more frequently with regular and casual partners than did females, while females reported having sex with paying partners more frequently than did males.

Significantly[§], in 2003, street youth who tested positive for chlamydia had on average more paying partners per week than youth who tested negative (an average of 19 partners vs. 8 partners respectively).

** Sexual activities could have ranged from sexual fondling to penis penetration or genital contact with a finger, the mouth or an object.

Figure 8. Average number of times street youth had sex per week by partner type in 2003

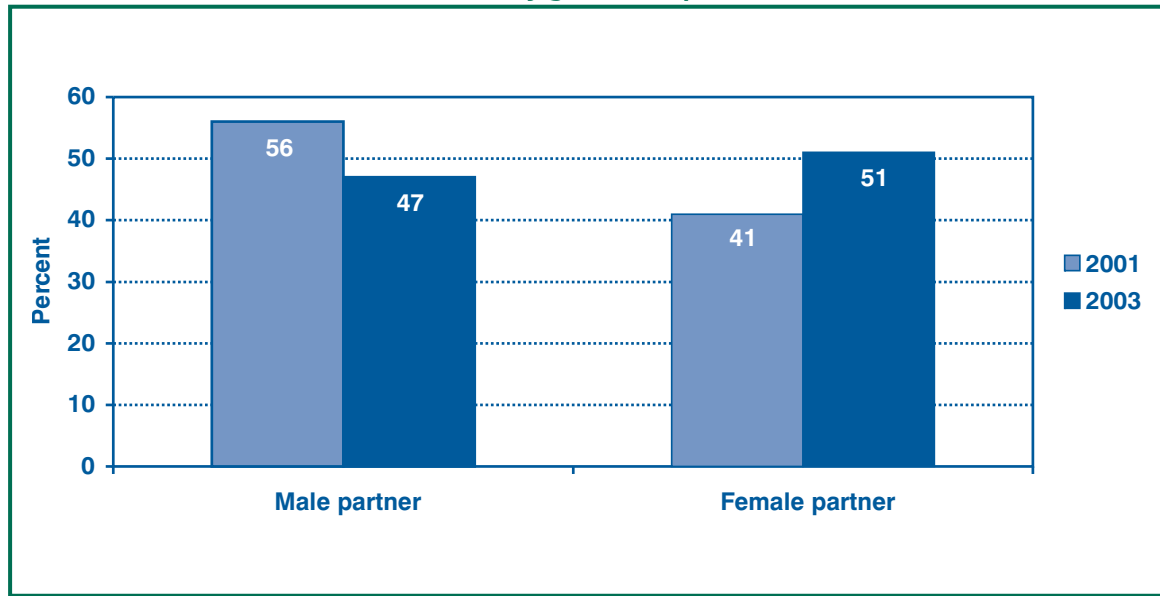


5.2 Condom Use

Comparisons of condom use by street youth across survey years are complicated by the fact that the questions on condom use in the 1999 survey differed from those used in 2001 and 2003. Nevertheless, an examination of condom use by sexually active street youth across survey years revealed that a high proportion of youth reported not using condoms.

In 2001 and 2003, youth were asked to report if they had used condoms at the most recent sexual encounter with their sexual partners. Figure 9 shows that in 2001, 56% of street youth reported not using a condom at their last sexual encounter with a male sex partner, and 41% reported not using a condom with a female sex partner. In 2003, 47% of youth reported not using condoms with their male sexual partner, and 51% reported not using condoms with their female sexual partner at the last episode of sexual intercourse. While these proportions are high, they are consistent with other findings. In a study of risk behaviours for AIDS among homeless youth, one-third of sexually active youth reported irregular condom use;³ furthermore, 32% of youth in the *Street Youth and AIDS* study reported never using condoms.¹¹

Figure 9. Proportion of street youth who reported not using condoms for protection at their last sexual encounter by gender of partner in 2001 and 2003



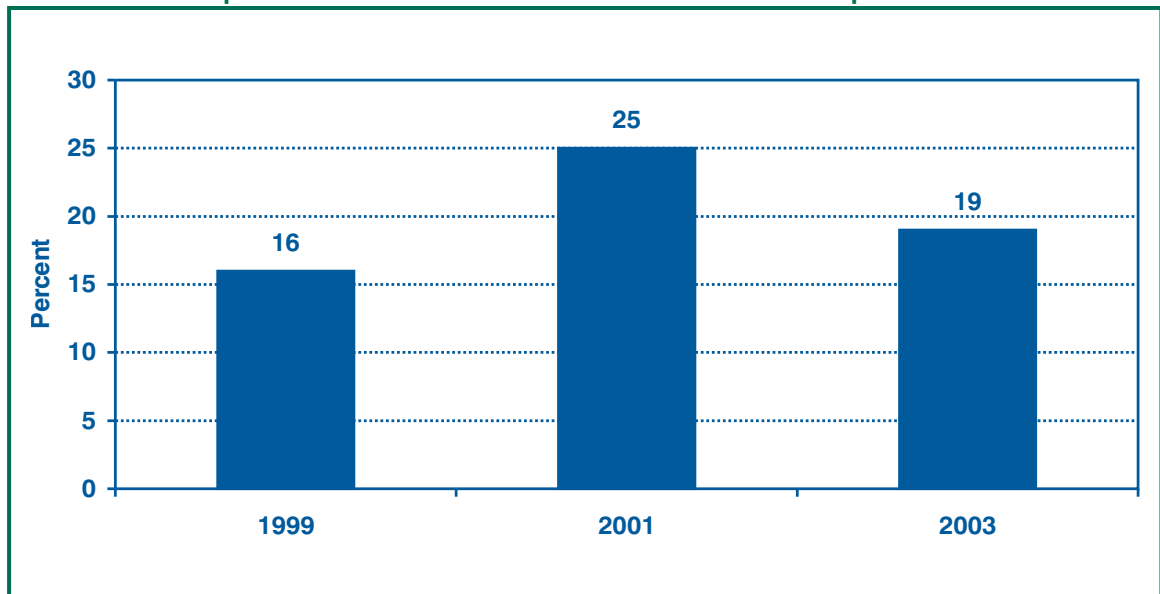
In 2003, the prevalence of both chlamydia and genital herpes (HSV-2) was found to be significantly^s higher in street youth who reported no condom use at their last sexual encounter with a female sexual partner than in those who reported using a condom (12.2% vs. 8.7% for chlamydia and 20.9% vs. 13.4% for genital herpes).

Street youth with a history of sex trade involvement were also asked to report on condom use the last time they engaged in commercial sex. As Figure 10 shows, self-reported condom use by street youth with a history of sex trade participation at their last sexual encounter with a client partner fluctuated from 16% in 1999 to 25% in 2001 and 19% in 2003. In both 1999 and 2003, male street youth were significantly^s more likely than females to report not using condoms at their last episode of sex with a client partner (21% vs. 9% and 29% vs. 10% respectively).

In 2003, 44% of street youth reported not using condoms the last time they were obligated^{***} to have sex, with significantly^s more males (47%) than females (39%) reporting this.

*** Obligatory sex is defined as feeling obligated to have sex *after* receiving money, gifts, drugs or a place to sleep.

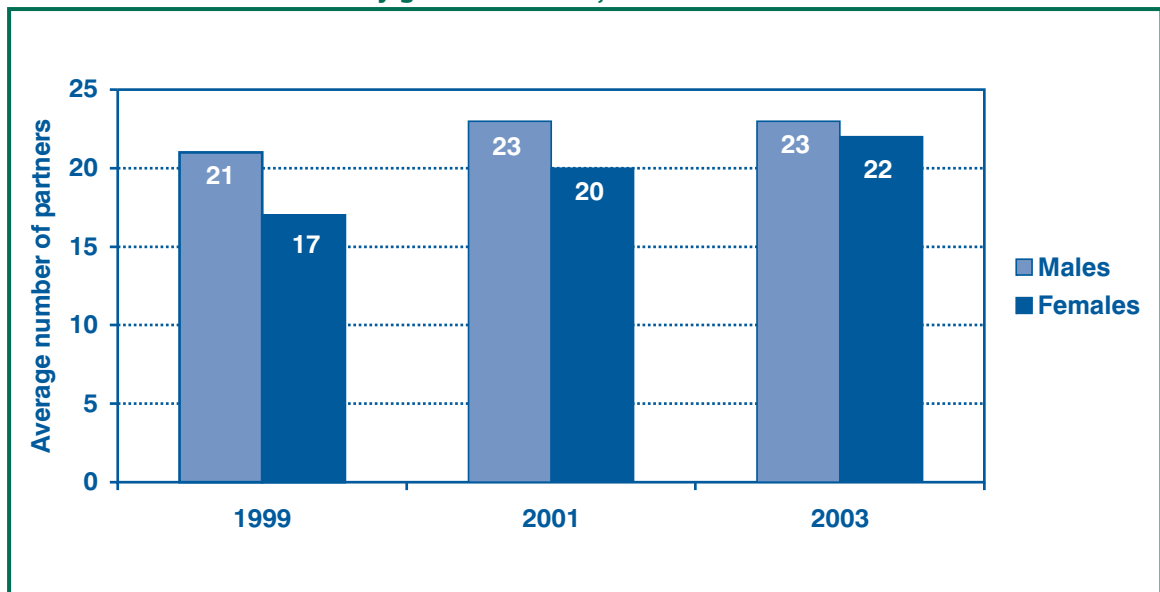
Figure 10. Proportion of street youth in 1999, 2001, and 2003 with a history of sex trade involvement who reported not using condoms for protection at last sexual encounter with a client partner



5.3 Sexual Partners

A key measure of sexual risk behaviour, particularly with respect to STIs, is the number of sexual partners.²⁵ On average, street youth reported having had more than 17 sex partners in their lifetime, with males reporting more partners than did females (Figure 11).

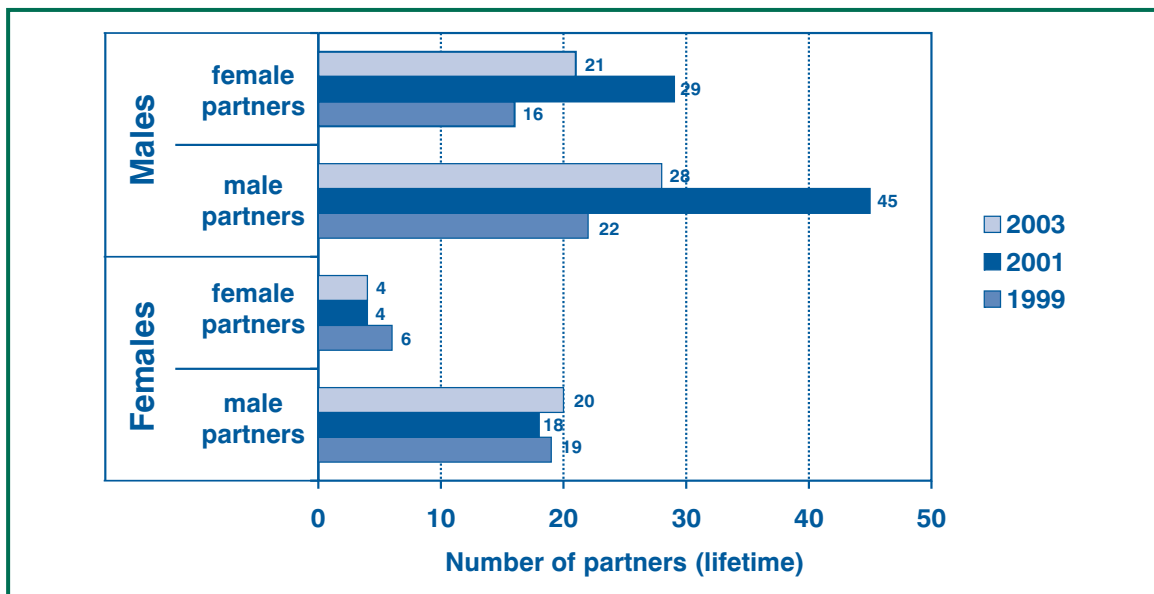
Figure 11. Average lifetime number of sexual partners among street youth by gender in 1999, 2001 and 2003



The average number of partners was highest in youth who reported MSM**** activities. In 2001, male youth who reported having had sex with another male reported having had 45 partners on average, which is more than double the average number of partners reported by other youth (Figure 12). Overall, 19.9% of street youth reported having engaged in GLB+ activities in their lifetime.

In 2003, the average number of partners reported by female street youth who tested positive for chlamydia, gonorrhoea and genital herpes (HSV-2) was significantly^s higher than among female youth who tested negative (27 vs. 20 for chlamydia, 28 vs. 21 for gonorrhoea and 33 vs. 13 for genital herpes). This difference was not seen among male street youth.

Figure 12. Lifetime number of partners by sexual relationship in 1999, 2001 and 2003



5.4 High-Risk Partners

In 2001 and 2003, street youth were asked about the risk behaviours of their sexual partners. Street youth reported having high-risk partners – partners who had been told they had an STI (17.0% in 2001 and 16.0% in 2003), who used sex to make ends meet (7.1% in 2001 and 9.5% in 2003) and/or who were under the influence of drugs while having sex with them (47.4% in 2001 and 50.8% in 2003). In both years, significantly^s more females than males (21.2% vs. 13.7% in 2001, and 18.7% vs. 14.3% in 2003) reported having a sexual partner with a history of previous STI and significantly^s more males than females (9.9% vs. 3.8% in 2001 and 11.3% vs. 7.1% in 2003) reported having a partner who used sex to make ends meet.

****MSM: Men who have sex with men.

+ GLB: Gay, lesbian, bisexual.

5.5 Unwanted Sex

E-SYS defined unwanted sex as having sex, but not wanting to do so, with someone in a position of authority. In all survey years, the average age at which the first episode of unwanted sex occurred was 8.7 years, with females (8.4 years) reporting a slightly younger age than males (9.2 years).

The proportion of street youth who reported having experienced unwanted sex remained stable at 17.3% in 1999, 18.3% in 2001, and 18.2% in 2002. The proportion of female youth who reported having experienced unwanted sex was more than double that of males; the difference was significant^s in all survey years (26.6% vs. 11.4% in 1999, 28.0% vs. 11.0% in 2001 and 27.8% vs. 12.5% in 2003).

Street youth who reported GLB activities in their lifetime were significantly^s more likely to have experienced unwanted sex than those who reported no GLB activity (38.4% vs. 12.9% in 1999, 40.1% vs. 12.9% in 2001, and 32.5% vs. 13.2% in 2003). In all survey years, youth who had experienced unwanted sex were also significantly^s more likely to report having traded sex at some point in their lives (44.4% vs. 16.2%). In 2003, youth who had experienced unwanted sex were significantly^s more likely to report no condom / sexual barrier use at their last sexual encounter than those who had not experienced unwanted sex (67.1% vs. 48.8%).

STI prevalence was not significantly^s associated with unwanted sex, except in 2003; youth who reported that a family member, relative or other person in a position of authority had had sex with them had higher prevalence rates of chlamydia (16.4% vs. 10.0%) and genital herpes (HSV-2) (28.1% vs. 17.2%) than youth who reported no unwanted sex.

5.6 Sex Trade

While there are varying definitions of sex trade in the literature, the following definition was adapted for use in E-SYS. “Sex trade” was defined as the exchange of sexual activities to meet subsistence needs such as food, shelter and protection. On average, 21.2% of street youth reported having traded sex at some point in their lives – 20.2% in 1999, 20.9% in 2001 and 22.6% in 2003. In all survey years, female street youth were significantly^s more likely to report trading sex than were males. The average age at which the first sex trade occurred, across survey years, was 15.8 years, with females (15.0 years) being consistently younger than males (16.5 years) at that time.

Youth who reported having traded sex were significantly^s more likely than youth who had not traded sex to have been told they had an STI (44.4% vs. 13.8% in 1999, 44.1% vs. 18.4% in 2001 and 49.5% vs. 21.9% in 2003). Rates of chlamydia and gonorrhoea were not found to be significantly^s higher in youth who reported a sex trade history; however, in 2003, the rate of genital herpes (HSV-2) was significantly^s higher in youth who reported a sex trade history (33.5% vs. 15.3%).

5.7 Obligatory Sex

In 2003, street youth were asked if they ever had obligatory sex – defined as having sex when feeling obligated to do so *after* receiving money, gifts, drugs or a place to sleep, 18.5% of street youth reported they had felt obligated to have sex at some time, with females significantly^s more likely to have experienced this than males (25.5% vs. 14.3%). The average age at which the first episode of obligated sex occurred was 16 years for both males and females. Youth reported having obligatory sex in order to receive shelter (38%), cigarettes, drugs and/or alcohol (33.2%) and money (25.9%). While rates of chlamydia and gonorrhoea were not found to be significantly^s higher in youth who reported a history of obligatory sex, the rate of genital herpes was found to be significantly^s higher (29.5% vs. 16.9%).

5.8 Previous STIs

It has been reported in the literature that youth do not significantly change their behaviours, attitudes or perceptions following the diagnosis of an STI, when compared to those who have not been diagnosed with an STI.²⁶ One study further suggested that youth may temporarily change their behaviours following diagnosis with an STI but then revert to their previous patterns.¹⁵ A study of street youth, young sex workers and other at-risk women found that one-third of female youth surveyed and one-quarter of male youth surveyed reported a history of STIs.⁷ Similar results were found in E-SYS.

In 1999, street youth who reported that they had been previously diagnosed with an STI had significantly^s higher rates of chlamydia than those who reported no previous STI diagnosis (11.7% vs. 7.8%). In 2001 and 2003, this association was found among street youth aged 15–19 years, but not for the overall street youth population.

In 2003, females who reported a previous chlamydia infection had significantly^s higher rates of chlamydia than those who reported no previous infection (12.9% vs. 2.7%). There were no associations between a reported history of gonorrhoea and testing positive for gonorrhoea. For genital herpes (HSV-2), street youth who reported a history of STI or genital herpes had significantly^s higher rates than those who reported no previous infection.

Youth were asked if they used protection after they were diagnosed with an STI. There were no associations seen across survey years between reported use of protection among street youth with a reported history of STI and tested rates of chlamydia, gonorrhoea and genital herpes.

Moreover, youth who reported that they started using protection after an STI diagnosis were asked if they were still using protection. In 2003, youth who reported that they were still using protection had significantly^s lower rates of gonorrhoea than those who reported that they had stopped using protection (2.8% vs. 9.4%).

5.9 Self-Perceived Risk and STIs

Across survey years, street youth were asked to identify their level of risk of contracting an STI. In 1999, youth who believed that they were at no risk to low risk of contracting STIs had significantly^s lower rates of chlamydia than those who believed that they were at medium to high risk. No other associations were seen between self-perceived risk of STIs and rates of chlamydia, gonorrhoea and genital herpes (HSV-2) in 1999, 2001 or 2003. Table 3 compares the sexual behaviours of youth based on their self-perceived risk of contracting STIs in 2003.

Table 3. Sexual behaviours and self-perceived risk among street youth in 2003

Sexual Behaviour	Self-Perceived Risk	
	Zero to Low	Medium to High
§Had been tested for STIs (any of HIV, HCV, HBV, gonorrhoea and chlamydia)	69.0%	78.0%
§Had been told they had an STI	19.0%	33.0%
§No condom use at last encounter with female partner	49.0%	57.0%
No condom use at last encounter with male partner	47.0%	47.5%
§Obligated sex in previous 3 months	17.4%	29.6%
No condom use at last obligated sexual encounter	45.8%	42.1%
§Sex trade in previous 3 months	28.0%	42.3%
No condom use at last sex trade encounter	24.0%	17.9%
Behaviour of Sex Partners in Previous 3 Months		
§Used drugs by non-injecting routes	72.3%	86.0%
§Injected drugs	8.0%	19.0%
§Under the influence of drugs during sex	45.0%	64.3%
§Had been told they had an STI	14.0%	22.1%
§Traded sex	7.1%	16.0%

As shown in Table 3, street youth who reported having high-risk sexual partners in the previous three months were significantly[§] more likely to believe they were at medium to high risk of STIs than those who did not report having high-risk sexual partners in this same time period. Also, street youth who had been tested for STIs, who had not used condoms at their last sexual encounter with a female partner, who had had obligatory sex in the previous three months and who had traded sex in the previous three months were significantly[§] more likely to believe that they were at medium to high risk of contracting STIs.

6. Substance Use and STIs



Overall, STI rates were not found to be significantly^s higher in street youth with a recent history of alcohol intoxication than in those without such a history. In 1999, the rate of chlamydia was found to be significantly^s higher in youth who reported the use of crystal methamphetamine than those who did not (17.2% vs. 8.2%), especially among females (33.3% vs. 9.4%). In 2003, the rate of gonorrhoea was significantly^s higher in street youth who reported using crystal methamphetamine than those who did not (6.9% vs. 2.8%), while the rate of genital herpes (HSV-2) was significantly higher in street youth who reported any drug use (whether by injecting or not) than those who reported no drug use (26.8% vs. 16.7%). The relationship between substance use and blood-borne pathogens will be examined in depth in a forthcoming report on hepatitis C and IDU among street youth.



7. Implications

For most street youth, preoccupation with meeting immediate basic needs often extinguishes concerns about health risks.³ Rates of STIs have been shown to be much higher among street youth than in the general youth population. Sufficient resources need to be allocated to provide outreach services such as STI prevention, screening and treatment to street youth, and such services need to be made accessible through community-based programs.

More than 40% of street youth reported not using condoms at their last sexual encounter. Since inconsistent condom use is so prevalent among street youth, timely educational and structural interventions are required to teach this population harm reduction measures and to improve access to the tools needed to implement such measures (i.e. improved accessibility of condoms) that will greatly reduce their risk of exposure to STIs. Research has shown that consistent users of condoms (condoms used 100% of the time) have significantly lower rates of chlamydia than inconsistent users (condoms used 25% to 75% of the time).²⁷

Consistent and correct condom use plays a critical role in preventing the spread of STIs as well as unintended pregnancy.²⁸ Efforts to promote consistent condom use among street youth should be ongoing.

Early initiation of sexual intercourse is often used as an indicator of risky sexual behaviour.¹⁰ In E-SYS, the average reported age at first sexual intercourse was 14 years, much lower than the average age of 17 years in the general youth population.²² On average, street youth also reported a high number of sexual partners, no fewer than 17 in their lifetime.

Educational interventions that are sensitive to the circumstances of street youth are critical. As with the general population, these programs should include providing street youth with assistance in evaluating their personal degree of risk and developing both the skills needed to reduce their risk and the internal motivation to do so.³ This strategy could provide substantial benefits as a component of ongoing programs for street youth.¹⁰ Sexual health education in schools will benefit street youth who are still studying or have completed secondary education, but more aggressive interventions need to be targeted at youth who have dropped out and who may not be captured in school-based programs.

Strategies to decrease risk behaviours among street youth may include eliminating the need for many of these youth to rely on illegal activities as a source of income or as survival mechanisms. A long-term multi-faceted approach will be required to make inroads into this problem. As substantiated in this study, street youth trade sex for income, and STI rates were

found to be higher among youth who report having engaged in prostitution.¹³ Risks and dangers associated with prostitution in street youth include physical and sexual assault, drug addiction, depression and STIs.¹³ The dangers inherent in “survival sex” are among the most dangerous repercussions of homelessness among youth.²⁹ In E-SYS, more than one-fifth (21%) of street youth reported having traded sex at some point in their lives; these findings show that there is an urgent need to develop intensive and long-term services that provide alternatives to the sex trade as means of meeting economic needs.²⁹

Finally, harm reduction approaches such as consistent and correct condom use, later initiation of sexual activities and reduction in the number of sexual partners, need to be advocated and supported among street youth. Street youth who are at risk should be counselled regarding what they can do to minimize their risk of becoming infected with infectious agents or transmitting these agents to others, including vaccination against hepatitis B.



8. Conclusion

In a homeless environment, where many youth must regularly take great risks just to survive, long-range health concerns can be expected to take on less importance.³ Street youth are particularly vulnerable to STIs because of the many risk factors to which they are exposed during their time on the streets.

Street youth engage in behaviours such as injecting drug use, unprotected sex, sex with high-risk partners and multiple partners; these behaviours increase their risk of contracting and transmitting STIs and blood-borne infections. As mentioned previously, the development of street-based interventions directed at reducing risk and promoting sexual health is critical.

The health consequences of high-risk sexual and drug-use behaviours are of concern. As shown in E-SYS and in previous studies, street youth did not significantly change their behaviours, attitudes and perceptions following diagnosis of an STI. Greater effort is needed in service provision, health promotion and research to identify the interventions that are most likely to succeed among this population.¹⁵

More effective interventions targeting this high-risk population are needed. It is hoped that findings from this study will be utilized to inform public policy and the design of public health interventions to benefit Canada's street youth.

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